Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 2 of 17

Attorney Docket No.: 13361-071001 / MP0345

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1.   (Original) A method comprising:

writing one of a plurality of sets in an allocation memory into an allocation register, wherein the allocation memory includes a plurality of data elements arranged in the plurality of sets, each of said data elements being associated with a corresponding plurality of buffers in a buffer memory;

in response to an allocation request,

identifying a data element in the allocation register having a value corresponding to an available buffer;

changing the value of said data element to a value corresponding to an allocated buffer; and

allocating the buffer associated with said data element.

2.   (Original) The method of claim 1, wherein each of the plurality of data elements comprises a single bit.

3.   (Original) The method of claim 1, wherein each of the plurality of sets comprises a line in the allocation memory.

4.   (Original) The method of claim 1, further comprising:

in response to a clear request for one of the plurality of buffers,

identifying a data element associated with said buffer in one of the allocation memory and the allocation register; and

changing a value of said data element to the value corresponding to an available buffer.

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 3 of 17

Attorney Docket No.: 13361-071001 / MP0345

5. (Original) The method of claim 4, further comprising:

in response to identifying the data element associated with said buffer in the allocation memory,

writing the set including said data element to a clear register; and

after changing the value of said data element in the clear register,

writing the set in the clear register to the allocation memory.

6. (Original) The method of claim 1, further comprising:

monitoring the values of each of the data elements in the allocation register; and

in response to each of said data elements having the value corresponding to an allocated buffer,

writing the data elements in the allocation register back to the allocation memory;

identifying a set including at least one data element having the value corresponding to an available buffer; and

writing said set to the allocation register.

7. (Original) The method of claim 6, further comprising:

providing a vector including a plurality of data elements, ,each data element being associated with a corresponding one of the plurality of sets;

changing a value of a data element in the vector from the allocation register to a value corresponding to a full set in response to writing the set associated with said data element in the vector to the allocation memory; and

changing the value of said data element in the vector to a value corresponding to an available set in response to the value of one of the data elements in said set being changed to the value corresponding to an available buffer.

8. (Original) The method of claim 7, further comprising:

identifying a set including at least one data element with the value corresponding to an available buffer by examining the values of the data elements in the vector.

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 4 of 17

Attorney Docket No.: 13361-071001 / MP0345

9.-17. (Withdrawn)

18. (Original) An apparatus comprising:

an allocation memory including a plurality of data elements arranged in a plurality of sets, each of said data elements being associated with a corresponding plurality of buffers in a buffer memory;

an allocation register; and

a buffer manager to

write one of said plurality of sets into the allocation register, and

in response to an allocation request,

identify a data element in the allocation register having a value corresponding , to an available. buffer,

change the value of said data element to a value corresponding to an allocated buffer, and

allocate the buffer associated with said data element.

19. (Original) The apparatus of claim 18, wherein each of the plurality of data elements comprises a single bit.

20. (Original) The apparatus of claim 18, wherein each of the plurality of sets comprises a line in the allocation memory.

21. (Original) The apparatus of claim 18, wherein the buffer manager is further operative to:

in response to a clear request for one of the plurality of buffers,

identify a data element associated with said buffer in one of the allocation memory and the allocation register; and

change a value of said data element to the value corresponding to an available buffer.

22. (Original) The apparatus of claim 21, wherein the buffer manager is further operative to:

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 5 of 17

Attorney Docket No.: 13361-071001 / MP0345

in response to identifying the data element associated with said buffer in the allocation memory,

write the set including said data element to a clear register; and

after changing the value of said data element in the clear register,

write the set in the clear register to the allocation memory.

23. (Original) The apparatus of claim 18, wherein the buffer manager is further operative to:

monitor the values of each of the data elements in the allocation register; and

in response to each of said data elements having the value corresponding to an allocated buffer,

write the data elements in the allocation register back to the allocation memory;

identify a set including at least one data element having the value corresponding to an available buffer; and

write said set to the allocation register.

24. (Original) The apparatus of claim 23, further comprising:

a line indication module to

generate a vector including a plurality of data elements, each data .element being associated with a corresponding one of the plurality of sets,

change a value of a data element in the vector to a value corresponding to a full set in response to writing the set associated with said data, element in the vector to the allocation memory, and

change the value of said data element in the vector from the allocation register to a value corresponding to an available set in response to the value of one of the data elements in said set being changed to the value corresponding to an available buffer.

25. (Original) The apparatus of claim 24, wherein the line indication module is further operative to:

identify a set including at least one data element with the value corresponding to an

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 6 of 17

Attorney Docket No.: 13361-071001 / MP0345

available buffer by examining the values of the data elements in the vector.

26.   (Original) The apparatus of claim 18, wherein the allocation memory comprises an SRAM.

37.-45.   (Withdrawn)

56.   (Original) A system comprising:

a switching module to receive and switch packets;

a buffer memory including a plurality of buffers to store received packets; and

a buffer management module including:

        an allocation memory including a plurality of data elements arranged in a plurality of sets, each of said data elements being associated with a corresponding one of the plurality of buffers in the buffer memory;

        an allocation register; and

        a buffer manager to

                write one of said plurality of sets into the allocation register, and

                in response to an allocation request,

        identify a data element in the allocation register having a value corresponding to an available buffer,

        change the value of said data element to a value corresponding to an allocated buffer, and

        allocate the buffer associated with said data element.

57.   (Original) The system of claim 56, wherein each of the plurality of data elements comprises a single bit.

58.   (Original) The system of claim 56, wherein each of the plurality of sets comprises a line in the allocation memory.

59.   (Original) The system of claim 56, wherein the buffer manager is further

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 7 of 17

Attorney Docket No.: 13361-071001 / MP0345

operative to:

in response to a clear request for one of the plurality of buffers,

identify a data element associated with said buffer in one of the allocation memory and the allocation register; and

change a value of said data element to the value corresponding to an available buffer.

60. (Original) The system of claim 59, wherein the buffer manager is further operative to:

in response to identifying the data element associated with said buffer in the allocation memory,

write the set including said data element to a clear register; and

after changing the value of said data element in the clear register,

write the set in the clear register to the allocation memory.

61. (Original) The system of claim 56, wherein the buffer manager is further operative to:

monitor the values of each of the data elements in the allocation register; and

in response to each of said data elements having the value corresponding to an allocated buffer,

write the data elements in the allocation register back to the allocation memory;

identify a set including at least one data element having the value corresponding to an available buffer; and

write said set to the allocation register.

62. (Original) The system of claim 61, further comprising:

a line indication module to

generate a vector including a plurality of data elements, each data element being associated with a corresponding one of the plurality of sets,

change a value of a data element in the vector to a value corresponding to a full set in response to writing the set associated with said data element in the vector to the allocation

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 8 of 17

Attorney Docket No.: 13361-071001 / MP0345

memory, and

change the value of said data element in the vector from the allocation register to a value corresponding to an available set in response to the value of one of the data elements in said set being changed to the value corresponding to an available buffer.

63. (Original) The system of claim 62, wherein the line indication module is further operative to:

identify a set including at least one data element with the value corresponding to an available buffer by examining the values of the data elements in the vector.

64. (Original) The system of claim 56, wherein the allocation memory comprises, an SRAM.

65.-74. (Withdrawn)

75. (Original) A system comprising:
a switching module including means for receiving and switching packets;
a buffer memory including a plurality of buffers for storing received packets; and
a buffer management module including:

an allocation memory including a plurality of data elements arranged in a plurality of sets, each of said data elements being associated with a corresponding plurality of buffers in a buffer memory;

an allocation register; and
a buffer manager including

means for writing one of said plurality of sets into the allocation register, and

means for, in response to an allocation request,

identifying a data element in the allocation register having a value corresponding to an available buffer,

changing the value of said data element to a value corresponding to an allocated buffer, and

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 9 of 17

Attorney Docket No.: 13361-071001 / MP0345

allocating the buffer associated with said data element.

76. (Original) The system of claim 75, wherein each of the plurality of data elements comprises a single bit.

77. (Original) The system of claim 75, wherein each of the plurality of sets comprises a line in the allocation memory.

78. (Original) The system of claim 75, wherein the buffer manager further comprises:

means for, in response to a clear request for one of the plurality of buffers,

identifying a data element associated with said buffer in one of the allocation memory and the allocation register, and

changing a value of said data element to the value corresponding to an available buffer.

79. (Original) The system of claim 78, wherein the buffer manager further comprises:

means for writing the set including said data element to a clear register in response to identifying the data element associated with said buffer in the allocation memory; and

means for writing the set in the clear register to the allocation memory after changing the value of said data element in the clear register.

80. (Original) The system of claim 75, wherein the buffer manager further comprises:

means for monitoring the values of each of the data elements in the allocation register; and

means for, in response to each of said data elements having the value corresponding to an allocated buffer,

writing the data elements in the allocation register back to the allocation memory,

identifying a set including at least one data element having the value corresponding to an

available buffer, and

writing said set to the allocation register.

81.   (Original) The system of claim 80, further comprising:

means for generating a vector including a plurality of data elements, each data element being associated with a corresponding one of the plurality of sets;

means for changing a value of a data element in the vector to a value corresponding to a full set in response to writing the set associated with said data element in the vector to the allocation memory; and

means for changing the value of said data element in the vector from the allocation register to a value corresponding to an available set in response to the value of ,one of the data elements in said set being changed to the value corresponding to an available buffer.

82.   (Original) The system of claim 81, further comprising:

means for identifying a set including at least one data element with the value corresponding to an available buffer by examining the values of the data elements in the vector.

83.   (Original) The system of claim 75, wherein the allocation memory comprises an SRAM.

84-93.   (Withdrawn)

94.   (Currently amended) A <u>computer-readable medium having instructions stored thereon, which, when executed by a processor, causes the processor to perform operations</u> ~~computer program~~ comprising:

writing one of a plurality of sets in an allocation memory into an allocation register, wherein the allocation memory includes a plurality of data elements arranged in the plurality of sets, each of said data elements being associated with a corresponding plurality of buffers in a buffer memory;

in response to an allocation request,

identifying a data element in the allocation register having a value corresponding to an

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 11 of 17

Attorney Docket No.: 13361-071001 / MP0345

available buffer;

changing the value of said data element to a value corresponding to an allocated buffer; and

allocating the buffer associated with said data element.

95. (Currently amended) The computer-readable medium ~~computer program~~ of claim 94, wherein each of the plurality of data elements comprises a single bit.

96. (Currently amended) The computer-readable medium ~~computer program~~ of claim 94, wherein each of the plurality of sets comprises a line in the allocation memory.

97. (Currently amended) The computer-readable medium ~~computer program~~ of claim 94, further comprising:

in response to a clear request for one of the plurality of buffers,

identifying a data element associated with said buffer in one of the allocation memory and the allocation register; and

changing a value of said data element to the value corresponding to an available buffer.

98. (Currently amended) The computer-readable medium ~~computer program~~ of claim 97, further comprising:

in response to identifying the data element associated with said buffer in the allocation memory,

writing the set including said data element to a clear register; and

after changing the value of said data element in the clear register,

writing the set in the clear register to the allocation memory.

99. (Currently amended) The computer-readable medium ~~computer program~~ of claim 94, further comprising:

monitoring the values of each of the data elements in the allocation register; and

in response to each of said data elements having the value corresponding to an allocated buffer,

Applicant : Yosef Solt et al.
Serial No. : 10/809,537
Filed : March 24, 2004
Page : 12 of 17

Attorney Docket No.: 13361-071001 / MP0345

writing the data elements in the allocation register back to the allocation memory;

identifying a set including at least one data element having the value corresponding to an available buffer; and

writing said set to the allocation register.

100. (Currently amended) The computer-readable medium ~~computer program~~ of claim 99, .further comprising:

providing a vector including a plurality of data elements, each data element being associated with a corresponding one of the plurality of sets;

changing a value of a data element in the vector from the allocation register to a value corresponding to a full set in response to writing the set associated with said data element in the vector to the allocation memory; and

changing the value of said data element in the vector to a value corresponding to an available set in response to the value of one of the data elements in said set being changed to the value corresponding to an available buffer.

101. (Currently amended) The computer-readable medium ~~computer program~~ of claim 100, further comprising:

identifying a set including at least one data element with the value corresponding to an available buffer by examining the values of the data elements in the vector.

102.-110. (Withdrawn)

111. (New) The method of claim 1, wherein each of the plurality of sets is a non-empty set.